



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,488	04/11/2006	Anja Gerhard	37241005000	2090
21005 7590 07/09/2008 HAMILTON, BROOK, SMITH & REYNOLDS, P.C. 530 VIRGINIA ROAD P.O. BOX 9133 CONCORD, MA 01742-9133				
EXAMINER				
WILLIAMS, AARON				
ART UNIT		PAPER NUMBER		
2889				
MAIL DATE		DELIVERY MODE		
07/09/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/565,488

**Applicant(s)**

GERHARD ET AL.

**Examiner**

Aaron Williams

**Art Unit**

4135

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 April 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 23-47 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 23-47 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SF/92)  
Paper No(s)/Mail Date 1/20/2006  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 24– 26, 29 -33, 41 are rejected under 35 U.S.C. 102(b) as being anticipated by U S Patent Grant Publication 2001/0051207 by Yamagata et al., herein refer to as Yamagata.

Regarding claim 24 Yamagata discloses in figure 2, ***An organic electroluminescent device, comprising: cathode*** (209, cathode, refer to paragraph [0008]) ; ***anode*** (202, anode, refer to paragraph [0008]); ***and at least two mutually delimited emission layers, said emission layers emitting different light wavelengths*** (206, 207, referred to as separate luminous layers refer to paragraph [0008]), ***wherein at least one emission layer further includes at least one phosphorescent emitter*** (refer to paragraph [0003] where it states the present invention incorporates the use of all known phosphorescence or fluorescence materials).

Regarding claims 25 and 26, Yamagata discloses in figure 2, ***the organic electroluminescent device as claimed in claim 24, further including additional layers such as a hole injection*** (203) ***and/or hole transport layers*** (204). Refer to paragraph [0008] for further discussion.

Regarding claims 29 and 30, Yamagata discloses in figure 2, ***the organic electroluminescent device as claimed in claim 24, wherein said device comprises three mutually delimited emission layers have the emission colors red, green and blue***. Refer to paragraph [0015] where there is a discussion of the three emission layers color spectrum.

Regarding claim 31 Yamagata discloses in figure 2, ***the organic electroluminescent device as claimed in claim 24, wherein the emission layers comprise both layers in which emitters are present as pure materials and layers in which a plurality of compounds are present in a dopant matrix system, the weight ratio of matrix material to emitter being from 99:1 to 1:99.*** Refer to paragraphs [0015] and [0022] where there is a discussion of the composition of the luminescence material and doping mixture.

Regarding claims 32 and 33 Yamagata discloses in figure 2, ***the organic electroluminescent device as claimed in claim 24, wherein the phosphorescent emitter is a compound having at least one atom of atomic number greater than 38 and less than 84 and wherein the phosphorescent emitter comprises molybdenum, tungsten, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, silver, gold or europium.*** Refer to paragraphs [0068] – [0076] where Yamagata incorporates the use of several variations of phosphorescence materials including platinum and iridium complexes.

Regarding claim 41 Yamagata discloses in figure 2, ***the organic electroluminescent device as claimed in claim 24, wherein the mutually delimited emitter layers have a thickness from 1 to 150 nm.*** Refer to paragraph [0015] where there is a discussion of the thickness of the three emission layers.

Regarding claim 46 Yamagata discloses in figure 2, ***the organic electroluminescent device as claimed in one or more of claims 31, wherein the glass transition temperature  $T_g$  of the matrix materials of the emission layers is greater than 100° C.*** The glass transition temperature is an inherent property of the of the emitter layers. That since the materials are anticipated in the prior art, they will have the same glass transition temperature in an OLED.

4. Claims 24, 27, 28, 34, 35, 45, 47 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 6,166,489 to Thompson et al., herein refer to as Thompson.

Regarding claim 24 Thompson discloses in figure 2 and 3, ***an organic electroluminescent device, comprising: cathode*** (105, cathode, referred to in column 4 lines 5 – 10) ; ***anode*** (101, anode, referred to in column 4 lines 5 – 10); ***and at least two mutually delimited emission layers, said emission layers emitting different light wavelengths*** (102, 104, referred to as separate OLED refer to column 3 lines 4 - 15), ***wherein at least one emission layer further includes at least one phosphorescent emitter*** (refer to column 5 lines 5 – 15 where it states the present invention incorporates the use of all known phosphorescence or fluorescence materials by reference).

Regarding claim 27 Thompson discloses in figure 2 and 3, ***the organic electroluminescent device as claimed in claim 24, further including additional***

**layers and electron injection and/or electron transport layers.** Refer to column 3 lines 50 - 56 where it states:

"For simplicity, the light emitting layers 102 and 104 are shown as single layers in the drawings. As is well-known in the art, however, these layers actually comprise multiple sublayers (e.g., HTL's, EL's and ETL's) when they are not single-layer polymer devices. The arrangement of the sublayers obviously depends on whether the device is of DH or SH configuration."

"ETL" stands for electron transport layer.

Regarding claim 28 Thompson discloses in figure 2 and 3, **the organic electroluminescent device as claimed in claim 24, wherein the device exhibits emission of light in the range from 380 nm to 750 nm.** Refer to column 3 lines 42 - 44 where Thompson discloses an OLED capable of emitting any visible color of light, which ranges 380 nm to 750 nm.

Regarding 34 and 35 Thompson discloses in figure 2 and 3, **the organic electroluminescent device as claimed in claim 24, wherein at least one of the emission layers further comprises at least one nonphosphorescent emitter comprising at least one of the styrylamines, coumarins, anthracenes, pyrenes, perylenes, oligoacenes, dicyanomethanes, compounds having spiro centers, heterocycles or metal complexes.** Refer to column 4 lines 41 - 43 where Thompson discloses the use of heterocycles emitter.

Regarding claim 45 Thompson discloses in figure 2 and 3, ***the organic electroluminescent device as claimed in claim 24, wherein the glass transition temperature  $T_g$  of the at least two emitter layers is greater than 90° C.*** The glass transition temperature is an inherent property of the of the emitter layers. That since the materials are anticipated in the prior art, they will have the same glass transition temperature in an OLED.

Regarding claim 47 Thompson discloses in figure 2 and 3, ***the organic electroluminescent device as claimed in claims 24, wherein the glass transition temperature  $T_g$  of any layer is greater than 90° C.*** The glass transition temperature is an inherent property of the of the emitter layers. That since the materials are anticipated in the prior art, they will have the same glass transition temperature in an OLED.

5. Claims 24, 27, 36- 40, 42- 44 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Grant Publication 2006/0084347 to Tutt et al., herein refer to as Tutt.

Regarding claim 24, Tutt discloses in figures 1 - 5, ***an organic electroluminescent device, comprising: cathode*** (30, cathode, refer to paragraph [0116]) ; ***anode*** (20, anode, refer to paragraph [0028]); ***and at least two mutually delimited emission***



**layers, said emission layers emitting different light wavelengths** (24, 26, referred to as separate emissive layers refer to paragraph [0117]), **wherein at least one emission layer further includes at least one phosphorescent emitter** (refer to paragraph [0076] where it states the present invention incorporates the use known phosphorescence or fluorescence material as being useful in the emissive region).

Regarding claim 27 Tutt discloses in figures 1 - 5, **the organic electroluminescent device as claimed in claim 24, further including additional layers and electron injection and/or electron transport layer**. This limitation is met by items 12 in figure 1b, and 36 in figure 5, referred to as hole blocking layers, in paragraph [0117] Tutt discloses that hole blocking layers facilitate electron flow i.e. electron transport.

Regarding claim 36 and 37 Tutt discloses in figures 1-5, **the organic electroluminescent device as claimed in claim 24, further including at least one hole blocking layer (HBL), wherein the HBL comprises at least one hole blocking material (HBM) selected from the azaphenanthrenes, metal chelate complexes, metal complexes or spirophenylenes, disposed between the at least two emission layers**. Refer to paragraphs [0109] and [0117] where the HBL composition is described as being made of "metal... chelated oxinoid compound." The HBL are located in between the red and blue emissive layers.

Regarding claim 38 Tutt discloses in figures 1 – 5, ***the organic electroluminescent device as claimed in claim 24, further including at least one electron blocking layer (EBL) disposed between the at least two emission layers.*** Refer to paragraph [0029] where a description of item 12, a hole transporting layer which is inherently a electron blocking layer. Then an electron blocking is deposited between a red emissive layer and a blue emissive layer in example 5, described in paragraphs [0153] – [0163].

Regarding claim 39 Tutt discloses in figures 1 – 5, ***the organic electroluminescent device as claimed in claim 38, wherein the EBL comprises at least one electron blocking materials (EBM) selected from the triarylamines, spirotriarylamines or the phthalocyanines.*** Refer to paragraph [0029] where a description of item 12, a hole transporting layer which is inherently an electron blocking layer.

Regarding claim 40 Tutt discloses in figure 5, ***the organic electroluminescent device as claimed in claim 24, further including at least one electron blocking layer (EBL) (38) and at least one hole blocking layer (HBL) (36) disposed between the at least two emission layers.*** Refer to paragraph [0138] for further details.

Regarding claim 42 Tutt discloses in figure 5, ***the organic electroluminescent device as claimed in claim 27, wherein the electron transport layer has a thickness from 1 to 150 nm.*** Refer to paragraph [0146] for a description of a 30 nm thick electron transport layer.

Regarding claim 43 Tutt discloses in figure 5, ***the organic electroluminescent device as claimed in claim 36, wherein the hole blocking layer has a thickness of from 1 to 150 nm.*** Refer to paragraph [0169] for a description of a 30 nm thick hole blocking layer.

Regarding claim 44 Tutt discloses in figure 5, ***the organic electroluminescent device as claimed in claim 24, further including at least one electron transport layer and at least one hole blocking layer, disposed between the at least two emission layers, wherein said at least one electron transport layer, at least one hole blocking layer and said emitter layers each have a different thickness in the range from 1 to 150 nm.*** Refer to paragraph [0138] for further details about the electron transport layer and the hole blocking being between emissive layers. Refer to paragraph [0169] for a description of a 30 nm thick hole blocking layer. Refer to paragraph [0146] for a description of a 30 nm thick electron transport layer. Refer to paragraph [0158] for a description of a 30.6 nm thick red emissive layer. Refer to paragraph [0161] for a description of a 25.3 nm thick red emissive layer.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron Williams whose telephone number is (571) 270-5279. The examiner can normally be reached on Monday thru Friday 7:00 to 5:00 EST.

Art Unit: 2889

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Toan Ton can be reached on (571)272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron Williams/  
Examiner, Art Unit 2889

/Karabi Guharay/  
Primary Examiner, Art Unit 2889